SEQUENCE LISTING

<110>	Martelange, Valerie De Smet, Charles Boon-Falleur, Thierry	
<120>	TUMOR ASSOCIATED NUCLEIC ACIDS AND USES THEREFOR	-
<130>	L0461.70047US00	
<150> <151>	US 09/183,789 1998-10-30	
<150> <151>	US 09/060,706 1998-04-15	
<160>	47	
<170>	PatentIn version 3.2	
<210> <211> <212> <213>	DNA	
<400> gatcgt	1 tgta cctcttcaag caaaatgaaa attctttcat aattttgccc aaaccttcga	60
acttct	ttca ttaattgata ttttatatca tcattaattt tctttgccat ggcaggagat	120
atttgt	ggtg tatttggcac agtttcaccg aagacattac tgtaactggt gggtcacgtg	180
cagaga	cact gtagtttttg gtgc	204
<210><211><211><212><213><400>	2 20 DNA Homo sapiens	20
tgtacc	tett caageaaaat	20
<210> <211> <212> <213>	3 20 DNA Homo sapiens	
<400>	3	
gtgacc	cacc agttacagta	20
<210><211><211><212><213>	4 9 PRT Homo sapiens	

```
<400> 4
Glu Ala Asp Pro Thr Gly His Ser Tyr
<210> 5
<211> 9
<212> PRT
<213> Homo sapiens
<400> 5
Ser Ala Tyr Gly Glu Pro Arg Lys Leu
<210> 6
<211> 9
<212> PRT
<213> Homo sapiens
<400> 6
Glu Val Asp Pro Ile Gly His Leu Tyr
<210> 7
<211> 9
<212> PRT
<213> Homo sapiens
<400> 7
Phe Leu Trp Gly Pro Arg Ala Leu Val
                5
<210> 8
<211> 10
<212> PRT
<213> Homo sapiens
<400> 8
Met Glu Val Asp Pro Ile Gly His Leu Tyr
<210> 9
<211> 9
<212> PRT
<213> Homo sapiens
<400> 9
```

```
Ala Ala Arg Ala Val Phe Leu Ala Leu
<210> 10
<211> 8
<212> PRT
<213> Homo sapiens
<400> 10
Tyr Arg Pro Arg Pro Arg Arg Tyr
<210> 11
<211> 10
<212> PRT
<213> Homo sapiens
<400> 11
Ser Pro Ser Ser Asn Arg Ile Arg Asn Thr
<210> 12
<211> 9
<212> PRT
<213> Homo sapiens
<400> 12
Val Leu Pro Asp Val Phe Ile Arg Cys
                5
<210> 13
<211> 10
<212> PRT
<213> Homo sapiens
<400> 13
Val Leu Pro Asp Val Phe Ile Arg Cys Val
                5
<210> 14
<211> 9
<212> PRT
<213> Homo sapiens
<400> 14
Glu Glu Lys Leu Ile Val Val Leu Phe
```

```
1 5
```

```
<210> 15
<211> 9
<212> PRT
<213> Homo sapiens
<400> 15
Glu Glu Lys Leu Ser Val Val Leu Phe
<210> 16
<211> 10
<212> PRT
<213> Homo sapiens
<400> 16
Ala Cys Asp Pro His Ser Gly His Phe Val
<210> 17
<211> 10
<212> PRT
<213> Homo sapiens
<400> 17
Ala Arg Asp Pro His Ser Gly His Phe Val
              5
<210> 18
<211> 9
<212> PRT
<213> Homo sapiens
<400> 18
Ser Tyr Leu Asp Ser Gly Ile His Phe
<210> 19
<211> 9
<212> PRT
<213> Homo sapiens
<400> 19
```

Ser Tyr Leu Asp Ser Gly Ile His Ser 1

```
<210> 20
<211> 9
<212> PRT
<213> Homo sapiens
<400> 20
Met Leu Leu Ala Val Leu Tyr Cys Leu
<210> 21
<211> 9
<212> PRT
<213> Homo sapiens
<400> 21
Tyr Met Asn Gly Thr Met Ser Gln Val
<210> 22
<211> 9
<212> PRT
<213> Homo sapiens
<400> 22
Ala Phe Leu Pro Trp His Arg Leu Phe
             5
<210> 23
<211> 9
<212> PRT
<213> Homo sapiens
<400> 23
Ser Glu Ile Trp Arg Asp Ile Asp Phe
<210> 24
<211> 9
<212> PRT
<213> Homo sapiens
Tyr Glu Ile Trp Arg Asp Ile Asp Phe
                 5
```

<210> 25

```
<212> PRT
<213> Homo sapiens
<400> 25
Gln Asn Ile Leu Leu Ser Asn Ala Pro Leu Gly Pro Gln Phe Pro
                                     10
<210> 26
<211> 15
<212> PRT
<213> Homo sapiens
<400> 26
Asp Tyr Ser Tyr Leu Gln Asp Ser Asp Pro Asp Ser Phe Gln Asp
<210> 27
<211> 10
<212> PRT
<213> Homo sapiens
<400> 27
Glu Ala Ala Gly Ile Gly Ile Leu Thr Val
1 . 5
<210> 28
<211> 9
<212> PRT
<213> Homo sapiens
<400> 28
Ala Ala Gly Ile Gly Ile Leu Thr Val
                5
<210> 29
<211> 9
<212> PRT
<213> Homo sapiens
<400> 29
Ile Leu Thr Val Ile Leu Gly Val Leu
                 5
<210> 30
<211> 9
<212> PRT
```

<211> 15

```
<400> 30
Lys Thr Trp Gly Gln Tyr Trp Gln Val
<210> 31
<211> 9
<212> PRT
<213> Homo sapiens
<400> 31
Ile Thr Asp Gln Val Pro Phe Ser Val
<210> 32
<211> 9
<212> PRT
<213> Homo sapiens
<400> 32
Tyr Leu Glu Pro Gly Pro Val Thr Ala
<210> 33
<211> 10
<212> PRT
<213> Homo sapiens
<400> 33
Leu Leu Asp Gly Thr Ala Thr Leu Arg Leu
<210> 34
<211> 10
<212> PRT
<213> Homo sapiens
<400> 34
Val Leu Tyr Arg Tyr Gly Ser Phe Ser Val
<210> 35
<211> 9
<212> PRT
<213> Homo sapiens
```

<213> Homo sapiens

```
Leu Tyr Val Asp Ser Leu Phe Phe Leu
<210> 36
<211>
      12
<212>
      PRT
<213> Homo sapiens
<400> 36
Lys Ile Ser Gly Gly Pro Arg Ile Ser Tyr Pro Leu
<210> 37
<211> 9
<212> PRT
<213> Homo sapiens
<400> 37
Tyr Met Asp Gly Thr Met Ser Gln Val
                5
<210> 38
<211> 2021
<212> DNA
<213> Homo sapiens
<220>
<221> CDS
<222> (119)..(1831)
<400> 38
ctcactatag ggagacccac gcttggtacc gagctcggat ccactagtaa cggccgccag
                                                                      60
tgtgctggaa agtgttcaac cagtgattat ttatttgaca gcaactggta ttccgggc
                                                                     118
atg aat acc agg gat cag tat gct acc atc act cac aat gtc tgt gaa
                                                                     166
Met Asn Thr Arg Asp Gln Tyr Ala Thr Ile Thr His Asn Val Cys Glu
                                                        1.5
1
gag aga gtg gta aat aac caa cca cta cct agt aac gcc ttg tca act
                                                                     214
Glu Arg Val Val Asn Asn Gln Pro Leu Pro Ser Asn Ala Leu Ser Thr
            20
                                                    30
gtt cta cca ggg ctt gct tat ttg gca aca gct gat atg cca gcc atg
                                                                     262
Val Leu Pro Gly Leu Ala Tyr Leu Ala Thr Ala Asp Met Pro Ala Met
        35
                            40
agt acc agg gat cag cat gct acc atc att cac aat ctg cgt gaa gag
                                                                     310
Ser Thr Arg Asp Gln His Ala Thr Ile Ile His Asn Leu Arg Glu Glu
```

<400> 35

50 55 60

						acc Thr									358
						gca Ala									406
	 _	_		_		gtc Val				_		_	_		454
						cag Gln 120									502
						gga Gly									550
						act Thr									598
						gat Asp									646
						ggt Gly									694
						caa Gln 200									742
					_	tat Tyr	_	_			-				790
		_		_	-	ggt Gly		_	-	_	_			_	838
_	-		-			aat Asn	_		_		_				886
						gtc Val									934
						gtt Val 280									982

								cgt Arg							1030
								tca Ser							1078
	_	-	_	_				tcc Ser	_			_	_		1126
								gag Glu 345							1174
								acg Thr							1222
								aga Arg							1270
								gag Glu							1318
								tct Ser							1366
								aat Asn 425							1414
_					-		_	gag Glu	_				_	_	1462
								aac Asn							1510
								gtg Val							1558
				_	_	_		aaa Lys		_	_				1606
								ttt Phe 505							1654

.

tta att tta att ann ana ata ann ann tat ata ann ata ann an	
ttc att ttg ctt gaa gag gta caa gga tct atg aaa gtc aag aga caa Phe Ile Leu Leu Glu Glu Val Gln Gly Ser Met Lys Val Lys Arg Gln 515 520 525	1702
ttt gtt gaa ttt acc atc aag gaa gca gca agg ttt aaa aaa gtt gtc Phe Val Glu Phe Thr Ile Lys Glu Ala Ala Arg Phe Lys Lys Val Val 530 535 540	1750
tta att cag caa ctc gag aag gcg ctt aaa gaa ata gat tcc cac tgc Leu Ile Gln Gln Leu Glu Lys Ala Leu Lys Glu Ile Asp Ser His Cys 545	1798
cat ctc aga aaa gtt aag cac atg aga aaa aga taattgtgtt agtgcaaag His Leu Arg Lys Val Lys His Met Arg Lys Arg 565 570	ya 1851
ccaaggagaa acaaggacat atgctgtagg atggaacagg ttattgctga agctcccta	at 1911
aatcctgaaa tgaagagaat tcccttccag aagctacgaa aaagggagct gtttaaatt	t 1971
aataaatctc tgttagtaaa agctgcaaaa aaaaaaaaaa	2021
<210> 39 <211> 571 <212> PRT <213> Homo sapiens	
<400> 39	
<400> 39 Met Asn Thr Arg Asp Gln Tvr Ala Thr Ile Thr His Asn Val Cvs Glu	
<pre><400> 39 Met Asn Thr Arg Asp Gln Tyr Ala Thr Ile Thr His Asn Val Cys Glu 1</pre>	
Met Asn Thr Arg Asp Gln Tyr Ala Thr Ile Thr His Asn Val Cys Glu	
Met Asn Thr Arg Asp Gln Tyr Ala Thr Ile Thr His Asn Val Cys Glu 1 5 5 Glu Arg Val Val Asn Asn Gln Pro Leu Pro Ser Asn Ala Leu Ser Thr	
Met Asn Thr Arg Asp Gln Tyr Ala Thr Ile Thr His Asn Val Cys Glu 15 Glu Arg Val Val Asn Asn Gln Pro Leu 25 Pro Ser Asn Ala Leu Ser Thr 30 Val Leu Pro Gly Leu Ala Tyr Leu Ala Thr Ala Asp Met Pro Ala Met	
Met Asn Thr Arg Asp Gln Tyr Ala Thr Ile Thr His Asn Val Cys Glu 15 Glu Arg Val Val Asn Asn Gln Pro Leu Pro Ser Asn Ala Leu Ser Thr 20 Val Leu Pro Gly Leu Ala Tyr Leu Ala Thr Ile Ile His Asn Leu Arg Glu Glu Ser Thr Arg Asp Gln His Ala Thr Ile Ile His Asn Leu Arg Glu Glu	
Met Asn Thr Arg Asp Gln Tyr Ala Thr 1le Thr His Asn Val Cys Glu 15 Glu Arg Val Val Asn Asn Asn Gln Pro Leu Pro Ser Asn Ala Leu Ser Thr 30 Ser Thr 35 Asg Asg Gln His Ala Thr 1le Ile His Asg Leu Arg Glu Glu Cys Lys Asg Asg Asg Ser Gln Pro Thr Pro Asg Asg Asg Val Leu Ser Ala Val	

Thr Arg Asp Gln Tyr Ala Thr Val Asn His His Val His Glu Ala Arg 100 105 110

- Met Glu Asn Gly Gln Arg Lys Gln Asp Asn Val Leu Ser Asn Val Leu 115 120 125
- Ser Gly Leu Ile Asn Met Ala Gly Ala Ser Ile Pro Ala Met Ser Ser 130 135 140
- Arg Asp Leu Tyr Ala Thr Ile Thr His Ser Val Arg Glu Glu Lys Met 145 150 155 160
- Glu Ser Gly Lys Pro Gln Thr Asp Lys Val Ile Ser Asn Asp Ala Pro 165 170 175
- Gln Leu Gly His Met Ala Ala Gly Gly Ile Pro Ser Met Ser Thr Lys 180 185 190
- Asp Leu Tyr Ala Thr Val Thr Gln Asn Val His Glu Glu Arg Met Glu
 195 200 205
- Asn Asn Gln Pro Gln Pro Ser Tyr Asp Leu Ser Thr Val Leu Pro Gly 210 215 220
- Leu Thr Tyr Leu Thr Val Ala Gly Ile Pro Ala Met Ser Thr Arg Asp 225 230 235 240
- Gln Tyr Ala Thr Val Thr His Asn Val His Glu Glu Lys Ile Lys Asn $245 \hspace{1.5cm} 250 \hspace{1.5cm} 255$
- Ile Asn Met Ala Ala Thr Gly Val Ser Ser Met Ser Thr Arg Asp Gln 275 280 285
- Tyr Ala Ala Val Thr His Asn Ile Arg Glu Glu Lys Ile Asn Asn Ser 290 295 300
- Gln Pro Ala Pro Gly Asn Ile Leu Ser Thr Ala Pro Pro Trp Leu Arg 305 310 315 320
- His Met Ala Ala Ala Gly Ile Ser Ser Thr Ile Thr Arg Asp Leu Tyr 325 330 335

Val Thr Ala Thr His Ser Val His Glu Glu Lys Met Thr Asn Gly Gln 340 345 350

Gln Ala Pro Asp Asn Ser Leu Ser Thr Val Pro Pro Gly Cys Ile Asn 355 360 365

Leu Ser Gly Ala Gly Ile Ser Cys Arg Ser Thr Arg Asp Leu Tyr Ala 370 375 380

Thr Val Ile His Asp Ile Gln Glu Glu Glu Met Glu Asn Asp Gln Thr 385 390 395 400

Pro Pro Asp Gly Phe Leu Ser Asn Ser Asp Ser Pro Glu Leu Ile Asn 405 410 415

Met Thr Gly His Cys Met Pro Pro Asn Ala Leu Asp Ser Phe Ser His 420 425 430

Asp Phe Thr Ser Leu Ser Lys Asp Glu Leu Leu Tyr Lys Pro Asp Ser 435 440 445

Asn Glu Phe Ala Val Gly Thr Lys Asn Tyr Ser Val Ser Ala Gly Asp 450 455 460

Pro Pro Val Thr Val Met Ser Ser Val Glu Thr Val Pro Asn Thr Pro 465 470 475 480

Gln Ile Ser Pro Ala Met Ala Lys Lys Ile Asn Asp Asp Ile Lys Tyr 485 490 495

Gln Leu Met Lys Glu Val Arg Arg Phe Gly Gln Asn Tyr Glu Arg Ile 500 505 510

Phe Ile Leu Leu Glu Glu Val Gln Gly Ser Met Lys Val Lys Arg Gln 515 520 525

Phe Val Glu Phe Thr Ile Lys Glu Ala Ala Arg Phe Lys Lys Val Val 530 535 540

Leu Ile Gln Gln Leu Glu Lys Ala Leu Lys Glu Ile Asp Ser His Cys 545 550 555 560

His Leu Arg Lys Val Lys His Met Arg Lys Arg

565 570

<211> <212>	40 201 DNA Homo sapiens					
	40 ctg aacctctact	: tacttttgaa	tattacgaat	tatttgtaaa	cattttgggc	60
ttgctgc	aac ctcatttaga	a gagggttgcc	atcgatgctc	tacagttatg	ttgtttgtta	120
cttcccc	cac caaatcgtag	g aaagcttcaa	cttttaatgc	gtatgatttc	ccgaatgagt	180
caaaatg	ttg atatgcccaa	a a				201
<211> <212> <213>	41 20 DNA Homo sapiens					
	41 gaa cctctactta	ı				20
<211> <212>	42 20 DNA Homo sapiens					
	42					20
atattaa	cat tttgactcat	•				2.0
<211> <212>	43 2463 DNA Homo sapiens					
	CDS (79)(1659)					
<400> gcttggt	43 acc gageteggat	: ccactagtaa	cggccgccag	tgtgctggaa	agggacgcca	60
ccgggcg	ctg acagacct a N	Met Glu Ser				111
	acc aag ctg t Thr Lys Leu T	rp Asn Glu				159

_	cct Pro		_			-									_	207
	aca Thr 45															255
	agc Ser															303
	agg Arg															351
	gga Gly															399
_	act Thr	_							_				_	_	-	447
	aac Asn 125								_		_	_				495
	cga Arg				_	_										543
	cag Gln															591
	gaa Glu		_		_		_	_		_	_	_	_	_	-	639
	gtt Val															687
	cca Pro 205															735
	ata Ile	_			_	_			_		_					783
	caa Gln															831
aag	tgc	cta	gca	aat	tgg	cca	aga	agc	aat	gat	atg	aat	aat	cca	act	879

Lys Cys		la Asn 55	Trp	Pro	Arg	Ser 260	Asn	Asp	Met	Asn	Asn 265	Pro	Thr		
tat gtt Tyr Val														927	
cta gat Leu Asp 285		_						_			_			975	
gta aac Val Asn 300														1023	
gat gct Asp Ala		_	-	-	_							_	_	1071	
aag ctt Lys Leu	Gln L													1119	
gat atg Asp Met														1167	
cat acc His Thr 365														1215	
gat gag Asp Glu 380														1263	
cag gaa Gln Glu														1311	
cat ctt His Leu	Asp T		Lys	Lys	Gly	His	Ile	Glu	Asn	Pro	Gly	Asp		1359	
cta ttt Leu Phe														1407	
cag gag Gln Glu 445														1455	
gaa ctt Glu Leu 460														1503	
aaa aga Lys Arg														1551	

cag aaa aga ttt cca acc acg gag agt gaa gca gca ctt ttt ggt gac Gln Lys Arg Phe Pro Thr Thr Glu Ser Glu Ala Ala Leu Phe Gly Asp 495 500 505	1599
aaa cct aca atc aag caa cca atg ctg att tta aga aaa cca aag ttc Lys Pro Thr Ile Lys Gln Pro Met Leu Ile Leu Arg Lys Pro Lys Phe 510 515 520	1647
cgt agt cta aga taactaactg aattaaaaat tatgtaatac ttgtggaact Arg Ser Leu Arg 525	1699
ttgataaatg aagccatatc tgagaatgta gctactcaaa aggaagtctg tcattaataa	1759
ggtatttcta aataaacaca ttatgtaagg aagtgccaaa atagttatca atgtgagact	1819
cttaggaaac taactagatc tcaattgaga gcacataaca atagatgata ccaaatactt	1879
tttgttttta acacagctat ccagtaaggc tatcatgatg tgtgctaaaa ttttatttac	1939
ttgaattttg aaaactgagc tgtgttaggg attaaactat aattctgttc ttaaaagaaa	1999
atttatctgc aaatgtgcaa gttctgagat attagctaat gaattagttg tttggggtta	2059
cttctttgtt tctaagtata agaatgtgaa gaatatttga aaactcaatg aaataattct	2119
cagctgccaa atgttgcact cttttatata ttctttttcc acttttgatc tatttatata	2179
tatgtatgtg tttttaaaat atgtgtatat tttatcagat ttggttttgc cttaaatatt	2239
atccccaatt gcttcagtca ttcatttgtt cagtatatat attttgaatt ctagttttca	2299
taatctatta gaagatgggg atataaaaga agtataaggc aatcatatat tcattcaaaa	2359
gatatttatt tagcaactgc tatgtgcctt tcgttgttcc agatatgcag agacaatgat	2419
aaataaaaca tataatotot tooaaaaaaa aaaaaaaaaa	2463

<210> 44

<211> 527

<212> PRT

<213> Homo sapiens

<400> 44

Met Glu Ser Gln Gly Val Pro Pro Gly Pro Tyr Arg Ala Thr Lys Leu $1 \hspace{1.5cm} 5 \hspace{1.5cm} 10 \hspace{1.5cm} 15$

His Arg Gln His Phe Lys Lys Tyr Gly Asn Cys Phe Thr Ala Gly Glu

Ala Val Asp Trp Leu Tyr Asp Leu Leu Arg Asn Asn Ser Asn Phe Gly

Pro Glu Val Thr Arg Gln Gln Thr Ile Gln Leu Leu Arg Lys Phe Leu

Lys Asn His Val Ile Glu Asp Ile Lys Gly Arg Trp Gly Ser Glu Asn

Val Asp Asp Asn Asn Gln Leu Phe Arg Phe Pro Ala Thr Ser Pro Leu

Lys Thr Leu Pro Arg Arg Tyr Pro Glu Leu Arg Lys Asn Asn Ile Glu

Asn Phe Ser Lys Asp Lys Asp Ser Ile Phe Lys Leu Arg Asn Leu Ser

Arg Arg Thr Pro Lys Arg His Gly Leu His Leu Ser Gln Glu Asn Gly

Glu Lys Ile Lys His Glu Ile Ile Asn Glu Asp Gln Glu Asn Ala Ile

Asp Asn Arg Glu Leu Ser Gln Glu Asp Val Glu Glu Val Trp Arg Tyr

Val Ile Leu Ile Tyr Leu Gln Thr Ile Leu Gly Val Pro Ser Leu Glu

Glu Val Ile Asn Pro Lys Gln Val Ile Pro Gln Tyr Ile Met Tyr Asn

Met Ala Asn Thr Ser Lys Arg Gly Val Val Ile Leu Gln Asn Lys Ser

Asp Asp Leu Pro His Trp Val Leu Ser Ala Met Lys Cys Leu Ala Asn

Trp Pro Arg Ser Asn Asp Met Asn Asn Pro Thr Tyr Val Gly Phe Glu

- Arg Asp Val Phe Arg Thr Ile Ala Asp Tyr Phe Leu Asp Leu Pro Glu 275 280 285
- Pro Leu Leu Thr Phe Glu Tyr Tyr Glu Leu Phe Val Asn Ile Leu Gly 290 295 300
- Leu Leu Gln Pro His Leu Glu Arg Val Ala Ile Asp Ala Leu Gln Leu 305 310 315 320
- Cys Cys Leu Leu Pro Pro Pro Asn Arg Arg Lys Leu Gln Leu Leu 325 330 335
- Met Arg Met Ile Ser Arg Met Ser Gln Asn Val Asp Met Pro Lys Leu 340 345 350
- His Asp Ala Met Gly Thr Arg Ser Leu Met Ile His Thr Phe Ser Arg 355 360 365
- Cys Val Leu Cys Cys Ala Glu Glu Val Asp Leu Asp Glu Leu Leu Ala 370 380
- Gly Arg Leu Val Ser Phe Leu Met Asp His His Gln Glu Ile Leu Gln 385 390 395 400
- Val Pro Ser Tyr Leu Gln Thr Ala Val Glu Lys His Leu Asp Tyr Leu 405 410 415
- Lys Lys Gly His Ile Glu Asn Pro Gly Asp Gly Leu Phe Ala Pro Leu 420 425 430
- Pro Thr Tyr Ser Tyr Cys Lys Gln Ile Ser Ala Gln Glu Phe Asp Glu 435 440 445
- Gln Lys Val Ser Thr Ser Gln Ala Ala Ile Ala Glu Leu Leu Glu Asn 450 460
- Ile Ile Lys Asn Arg Ser Leu Pro Leu Lys Glu Lys Arg Lys Lys Leu 465 470 475 480
- Lys Gln Phe Gln Lys Glu Tyr Pro Leu Ile Tyr Gln Lys Arg Phe Pro 485 490 495

Thr Thr Glu Ser Glu Ala Ala Leu Phe Gly Asp Lys Pro Thr Ile Lys 500 505

Gln Pro Met Leu Ile Leu Arg Lys Pro Lys Phe Arg Ser Leu Arg 520

<210> 45 <211> 5726 <212> DNA <213> Artificial

<220>

<223> unidentified cloning vector

<400> 45

<400> 45						
gacggatcgg	gagatetece	gatcccctat	ggtcgactct	cagtacaatc	tgctctgatg	60
ccgcatagtt	aagccagtat	ctgctccctg	cttgtgtgtt	ggaggtcgct	gagtagtgcg	120
cgagcaaaat	ttaagctaca	acaaggcaag	gcttgaccga	caattgcatg	aagaatctgc	180
ttagggttag	gcgttttgcg	ctgcttcgcg	atgtacgggc	cagatatacg	cgttgacatt	240
gattattgac	tagttattaa	tagtaatcaa	ttacggggtc	attagttcat	agcccatata	300
tggagttccg	cgttacataa	cttacggtaa	atggcccgcc	tggctgaccg	cccaacgacc	360
cccgcccatt	gacgtcaata	atgacgtatg	ttcccatagt	aacgccaata	gggactttcc	420
attgacgtca	atgggtggac	tatttacggt	aaactgccca	cttggcagta	catcaagtgt	480
atcatatgcc	aagtacgccc	cctattgacg	tcaatgacgg	taaatggccc	gcctggcatt	540
atgcccagta	catgacctta	tgggactttc	ctacttggca	gtacatctac	gtattagtca	600
tcgctattac	catggtgatg	cggttttggċ	agtacatcaa	tgggcgtgga	tagcggtttg	660
actcacgggg	atttccaagt	ctccacccca	ttgacgtcaa	tgggagtttg	ttttggcacc	720
aaaatcaacg	ggactttcca	aaatgtcgta	acaactccgc	cccattgacg	caaatgggcg	780
gtaggcgtgt	acggtgggag	gtctatataa	gcagagctct	ctggctaact	agagaaccca	840
ctgcttactg	gcttatcgaa	attaatacga	ctcactatag	ggagacccaa	gcttggtacc	900
gagctcggat	ccactagtaa	cggccgccag	tgtgctggaa	ttaattcgct	gtctgcgagg	960
gccagctgtt	ggggtgagta	ctccctctca	aaagcgggca	tgacttctgc	gctaagattg	1020
tcagtttcca	aaaacgagga	ggatttgata	ttcacctggc	ccgcggtgat	gcctttgagg	1080
gtggccgcgt	ccatctggtc	agaaaagaca	atctttttgt	tgtcaagctt	gaggtgtggc	1140
aggcttgaga	tctggccata	cacttgagtg	acaatgacat	ccactttgcc	tttctctcca	1200

caggtgtcca	ctcccaggtc	caactgcagg	tcgatcgagc	atgcatctag	ggcggccgca	1260
ctagaggaat	tcgcccctct	ccctccccc	cccctaacgt	tactggccga	agccgcttgg	1320
aataaggccg	gtgtgtgttt	gtctatatgt	gattttccac	catattgccg	tcttttggca	1380
atgtgagggc	ccggaaacct	ggccctgtct	tcttgacgag	cattcctagg	ggtctttccc	1440
ctctcgccaa	aggaatgcaa	ggtctgttga	atgtcgtgaa	ggaagcagtt	cctctggaag	1500
cttcttgaag	acaaacaacg	tctgtagcga	ccctttgcag	gcagcggaac	ccccacctg	1560
gcgacaggtg	cctctgcggc	caaaagccac	gtgtataaga	tacacctgca	aaggcggcac	1620
aaccccagtg	ccacgttgtg	agttggatag	ttgtggaaag	agtcaaatgg	ctctcctcaa	1680
gcgtagtcaa	caaggggctg	aaggatgccc	agaaggtacc	ccattgtatg	ggaatctgat	1740
ctggggcctc	ggtgcacatg	ctttacatgt	gtttagtcga	ggttaaaaaa	gctctaggcc	1800
ccccgaacca	cggggacgtg	gttttccttt	gaaaaacacg	atgataagct	tgccacaacc	1860
ccgtaccaaa	gatggataga	tccggaaagc	ctgaactcac	cgcgacgtct	gtcgagaagt	1920
ttctgatcga	aaagttcgac	agcgtctccg	acctgatgca	gctctcggag	ggcgaagaat	1980
ctcgtgcttt	cagcttcgat	gtaggagggc	gtggatatgt	cctgcgggta	aatagctgcg	2040
ccgatggttt	ctacaaagat	cgttatgttt	atcggcactt	tgcatcggcc	gcgctcccga	2100
ttccggaagt	gcttgacatt	ggggaattca	gcgagagcct	gacctattgc	atctcccgcc	2160
gtgcacaggg	tgtcacgttg	caagacctgc	ctgaaaccga	actgcccgct	gttctgcagc	2220
cggtcgcgga	ggccatggat	gcgatcgctg	cggccgatct	tagccagacg	agcgggttcg	2280
gcccattcgg	accgcaagga	atcggtcaat	acactacatg	gcgtgatttc	atatgcgcga	2340
ttgctgatcc	ccatgtgtat	cactggcaaa	ctgtgatgga	cgacaccgtc	agtgcgtccg	2400
tcgcgcaggc	tctcgatgag	ctgatgcttt	gggccgagga	ctgccccgaa	gtccggcacc	2460
tcgtgcacgc	ggatttcggc	tccaacaatg	tcctgacgga	caatggccgc	ataacagcgg	2520
tcattgactg	gagcgaggcg	atgttcgggg	attcccaata	cgaggtcgcc	aacatcttct	2580
tctggaggcc	gtggttggct	tgtatggagc	agcagacgcg	ctacttcgag	cggaggcatc	2640
cggagcttgc	aggatcgccg	cggctccggg	cgtatatgct	ccgcattggt	cttgaccaac	2700
tctatcagag	cttggttgac	ggcaatttcg	atgatgcagc	ttgggcgcag	ggtcgatgcg	2760
acgcaatcgt	ccgatccgga	gccgggactg	tegggegtae	acaaatcgcc	cgcagaagcg	2820
cggccgtctg	gaccgatggc	tgtgtagaag	tactcgccga	tagtggaaac	cgacgcccca	2880

2940 gcactcgtcc gagggcaaag gaatagagta gatgccgacc gaacaagagc tgatttcgag aacgcctcag ccagcaactc gcgcgagcct agcaaggcaa atgcgagaga acggccttac 3000 gettggtgge acagtteteg tecacagtte getaageteg eteggetggg tegegggagg 3060 3120 gccggtcgca gtgattcagg cccttctgga ttgtgttggt ccccagggca cgattgtcat gcccacgcac tegggtgate tgactgatee egcagattgg agategeege eegtgeetge 3180 cgattgggtg cagatctaga gctcgctgat cagcctcgac tgtgcctcta gttgccagcc 3240 3300 atctgttgtt tgcccctccc ccgtgccttc cttgaccctg gaaggtgcca ctcccactgt 3360 ggggggtggg gtggggcagg acagcaaggg ggaggattgg gaagacaata gcaggcatgc 3420 3480 tggggatgcg gtgggctcta tggcttctga ggcggaaaga accagctggg gctcgagtgc 3540 attetagttg tggtttgtee aaacteatea atgtatetta teatgtetgt ataeegtega 3600 cctctagcta gagcttggcg taatcatggt catagctgtt tcctgtgtga aattgttatc 3660 cgctcacaat tccacacaac atacgagccg gaagcataaa gtgtaaagcc tggggtgcct 3720 aatgagtgag ctaactcaca ttaattgcgt tgcgctcact gcccgctttc cagtcgggaa 3780 acctgtcgtg ccagctgcat taatgaatcg gccaacgcgc ggggagaggc ggtttgcgta ttgggcgctc ttccgcttcc tcgctcactg actcgctgcg ctcggtcgtt cggctgcggc 3840 3900 gageggtate ageteactea aaggeggtaa taeggttate caeagaatea ggggataaeg caggaaagaa catgtgagca aaaggccagc aaaaggccag gaaccgtaaa aaggccgcgt 3960 tgctggcgtt tttccatagg ctccgcccc ctgacgagca tcacaaaaat cgacgctcaa 4020 4080 gtcagaggtg gcgaaacccg acaggactat aaagatacca ggcgtttccc cctggaagct ecetegtgeg eteteetgtt eegaeeetge egettaeegg atacetgtee geetttetee 4140 ettegggaag egtggegett teteaatget eacgetgtag gtateteagt teggtgtagg 4200 4260 tegttegete caagetggge tgtgtgeaeg aaceeeegt teageeegae egetgegeet 4320 tatccggtaa ctatcgtctt gagtccaacc cggtaagaca cgacttatcg ccactggcag cagecactgg taacaggatt agcagagega ggtatgtagg eggtgetaca gagttettga 4380 agtggtggcc taactacggc tacactagaa ggacagtatt tggtatctgc gctctgctga 4440 4500 agccagttac cttcggaaaa agagttggta gctcttgatc cggcaaacaa accaccgctg gtagcggtgg tttttttgtt tgcaagcagc agattacgcg cagaaaaaaa ggatctcaag 4560 aagatcettt gatettttet aeggggtetg aegeteagtg gaaegaaaae teaegttaag 4620

```
ggattttggt catgagatta tcaaaaagga tcttcaccta gatcctttta aattaaaaat
                                                                     4680
gaagttttaa atcaatctaa agtatatatg agtaaacttg gtctgacagt taccaatgct
                                                                     4740
taatcagtga ggcacctatc tcagcgatct gtctatttcg ttcatccata gttgcctgac
                                                                     4800
teccegtegt gtagataact acgataeggg agggettaee atetggeece agtgetgeaa
                                                                     4860
tgataccgcg agacccacgc tcaccggctc cagatttatc agcaataaac cagccagccg
                                                                     4920
gaagggccga gcgcagaagt ggtcctgcaa ctttatccgc ctccatccag tctattaatt
                                                                     4980
                                                                     5040
gttgccggga agctagagta agtagttcgc cagttaatag tttgcgcaac gttgttgcca
ttgctacagg catcgtggtg tcacgctcgt cgtttggtat ggcttcattc agctccggtt
                                                                     5100
cccaacgatc aaggegagtt acatgatece ccatgttgtg caaaaaaageg gttageteet
                                                                     5160
teggteetee gategttgte agaagtaagt tggeegeagt gttateacte atggttatgg
                                                                     5220
cagcactgca taattctctt actgtcatgc catccgtaag atgcttttct gtgactggtg
                                                                     5280
                                                                     5340
agtactcaac caagtcattc tgagaatagt gtatgcggcg accgagttgc tcttgcccgg
cgtcaatacg ggataatacc gcgccacata gcagaacttt aaaagtgctc atcattggaa
                                                                     5400
aacgttcttc ggggcgaaaa ctctcaagga tcttaccgct gttgagatcc agttcgatgt
                                                                     5460
                                                                     5520
aacccactcg tgcacccaac tgatcttcag catcttttac tttcaccagc gtttctgggt
                                                                     5580
gagcaaaaac aggaaggcaa aatgccgcaa aaaagggaat aagggcgaca cggaaatgtt
gaatactcat actetteett ttteaatatt attgaageat ttateagggt tattgtetea
                                                                     5640
tgagcggata catatttgaa tgtatttaga aaaataaaca aataggggtt ccgcgcacat
                                                                     5700
ttccccgaaa agtgccacct gacgtc
                                                                     5726
```

```
<211> 456
<212> DNA
<213> Homo sapiens

<220>
<221> misc_feature
<222> (334)..(334)
<223> n is a, c, g, or t

<220>
<221> misc_feature
<220>
<221> misc_feature
<220>
<221> misc_feature
<221> misc_feature
<222> (442)..(442)
<223> n is a, c, g, or t

<400> 46
```

<210>

46

ccttttgagg taaactc	ctg tttttaataa	tattttctaa	aagttctgca	attgcagcat	60
tgagaggtag aaacttt	tct catcaaactc	ctgagcacta	atctgcttac	agtatgagta	120
agttggcaaa ggagcaaa	ata gtccatctcc	aggattttca	atatgtccct	tttttaagta	180
gtcaagatgt ttttcca	ctg cagtctgtaa	gtaagagggt	acttgaagaa	tttcctgatg	240
atgatccatt aagaaaga	aaa ctaatcttcc	agcaagaagc	tcatcaagat	ccacttcttc	300
agcacagcat aacacaca	atc gagaaaaggt	atgnatcatc	aagtgacctc	gtacccattg	360
catcatggaa gtttggg	cat atccaccatt	tttgactcat	tcggggaaat	catacgcatt	420
aaaagtttga agcttcta	acg antttggttg	ggggaa			456
<210> 47 <211> 459 <212> DNA <213> Homo sapiens	S				
gaacttgtga aaatcaat	taa aatgatttat	tttatatatg	caaaatcaaa	atctctttgt	60
acactttaat ttttgcaa	aat tcatacaaac	ataacaatac	tgctccatat	aaacttttgt	120
ataaacatta aaggaaa	tat acacatattt	tgttcttctt	gtgcttccaa	agcacagaat	180
gtataagtcc atctgaag	gac tttctatcat	cacatgcaag	aacaaatgtc	agaggttggg	240
ggcagcctca agtgcact	ttt gtaatgtctc	ttctcaaggt	actgaattag	gactcgtctt	300
ttaaaccttg cggcttco	ctt gatggtaaat	tcaacaaact	gtttcttcat	ctccagaggt	360
ccttgcactt cttcaag	caa aatgaaaatt	ctttcatatt	ttcgaccaaa	ctttcgaact	420

tccttcatta attgatggtt tatatcagca ttggattcc

459